PB85-249621

Superfund Record of Decision (EPA Region 7)
Rosalie and Callahan Properties
Ellisville Area Site, Ellisville
St. Louis County, Missouri, July 1985

(U.S.) Environmental Protection Agency
Washington, DC

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Superfund Record of Decision:

Ellisville, MO

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16. ABSTRACT

The Ellisville Area Site is located in St. Louis County, Missouri, about twenty miles west of downtown St. Louis. The site is comprised of three non-contiguous properties: the Rosalie Investment Company property, the Callahan site and the Bliss site. Containerized and bulk liquid and solid wastes were reportedly disposed of on these properties during the 1970s. The types of wastes include solvents, oils, sludges, pesticides, and flammable gelatenous materials.

The selected remedial action includes:

- Callahan Property. Stabilize and control erosion of the fill area; remove and dispose the plastic cover over the fill area and the cover's hold-down blocks; remove and salvage the barbed-wire and chain-link fences around the site; and remove the gravel in the two drum storage areas. Preliminary cost estimate for the remedial action is $12,000.

17. KEY WORDS AND DOCUMENT ANALYSIS		
a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Record of Decision Ellisville, MO Contaminated Media: soil, sw Key contaminants: solvents, oils, sludges, pesticides, phenols, toluene and flammable gelatenous materials		
18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)* None 20. SECURITY CLASS *(This page)* None	21. NO. OF PAGES 52 22. PRICE

16. Abstract (Continued)

- Rosalie Property. Offsite disposal of contaminated soil, buried drums, cans and other debris; soil excavation; and soil testing and analysis. Preliminary cost estimate for the remedial action is $52,000.

- Bliss Property. U.S. EPA is currently working on an expanded feasibility study for this site, since additional cleanup options should be evaluated for the dioxin contaminated soil.

Record of Decision
Remedial Alternative Selection

Site: Rosalie and Callahan Properties, Ellisville Area Site, Ellisville, St. Louis County, Missouri

Documents Reviewed

I have reviewed the following documents describing the analysis of cost-effectiveness of remedial alternatives for the Rosalie and Callahan Properties at the Ellisville Area Site.

--Study titled "Remedial Feasibility Study, Ellisville Hazardous Waste Disposal Site, Ellisville, Missouri," September 28, 1983.

--Study titled "Remedial Investigation, Ellisville Hazardous Waste Disposal Site, Ellisville, Missouri," September 21, 1983.

--Draft study titled, "Description of Current Situation, Ellisville Hazardous Waste Disposal Site, Ellisville, Missouri," August 30, 1982.

--Summary of Remedial Alternative Selection

--Staff summaries and recommendations.

--Recommendation by the Missouri Department of Natural Resources

Description of Selected Remedy

A. Jean Ellen Callahan Property

A remedial action should be implemented for the Jean Ellen Callahan property to control erosion and slippage of the fill area where drums were excavated during the 1981-82 immediate removal action and to remove the vestiges of that action. The remnants of the plastic cover over the fill area and the cover's hold-down blocks should be removed and disposed of. The soil in the fill area should be spread and regraded to a stable slope over a larger area and covered with a compacted soil layer which should be reseeded. The barbed-wire fence around the fill area and the chain-link fence around the two drum storage areas should be removed and salvaged. The gravel in the two drum storage areas should also be removed for possible salvage. The preliminary opinion of probable cost for this remedial action is $12,000.

B. Rosalie Investment Company Property

The most cost-effective remedial action -- offsite disposal of contaminated soil, buried drums, cans and other debris should be implemented for the Rosalie Investment Company property. Contaminated soil should be excavated from two locations on the property and transported in bulk to an offsite commercial hazardous waste disposal facility operating under RCRA permit or interim status and meeting CERCLA offsite policy. Drum lids, cans and other debris should be removed from three locations on the property and placed in drums. Buried drums should be excavated and overpacked, with the drum contents sampled and tested. The drums should be disposed of at an offsite commercial disposal facility operating under RCRA permit or interim status and meeting CERCLA offsite policy. Following soil testing and analysis to verify the effectiveness of the cleanup, borrow soil should be placed and compacted in the excavated areas, with all disturbed areas reseeded. The preliminary opinion of probable cost for this remedial action is $52,000.

Declarations

Consistent with the Comprehensive Environmental Response, Compensation and Liability Act of 1980, and the National Oil and Hazardous Substances Contingency Plan (40 CFR Part 300), I have determined that at the Rosalie Investment Company Property, the excavation of contaminated soil, buried drums, cans and other debris and offsite disposal at an appropriate commercial disposal facility operating under RCRA permit or interim status and meeting CERCLA offsite policy provides an appropriate level of cleanup. At the Jean Ellen Callahan Property, I have determined that erosion control of the fill area and removal of the onsite vestiges of the immediate removal action provides an appropriate level of cleanup. The actions taken are cost-effective remedies, and they effectively and reliably mitigate and minimize damage to, and provide adequate protection of public health, welfare and the environment. I have also determined that the actions taken are appropriate when balanced against the need to use Trust Fund money at other sites. In addition, the chosen remedy for the Rosalie Investment Company Property complies with the requirements of Section 101(24) of CERCLA because offsite disposal is more cost-effective than potential onsite remedies and necessary to protect public health and the environment.

7-10-85
Date

Morris Kay
Regional Administrator
Region VII, EPA

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

ELLISVILLE AREA SITE

ROSALIE AND CALLAHAN PROPERTIES

SITE LOCATION AND DESCRIPTION

The Ellisville Area Site is located in west St. Louis County, Missouri, about twenty miles west of downtown St. Louis, Missouri. The site lies west of Ellisville, Missouri, in Sections 31 and 32, Township 45 North, Range 4 East, as shown in Attachments A-1 and A-2.

The site is comprised of three non-contiguous properties which lie within a one-mile stretch along the watershed of Caulks Creek, a tributary of Bonhomme Creek, which enters the Missouri River about one mile upstream of a City of St. Louis waterworks intake. The population within a one-mile radius of the site is approximately 1,000. Within a three-mile radius the population includes 5,000 people and within five miles the population includes 8,000 to 10,000 people. The area is being rapidly developed as a residential community. Homes are being constructed in subdivisions as well as on single lots.

°Rosalie Site

One of the properties which comprise the site is owned by Rosalie Investment Company, a St. Louis County land development concern. The property is located approximately 0.4 miles southwest of the intersection of Clayton Road and Strecker Road west. A housing development owned and operated by Rosalie Investment Company, known as the Village of Winding Trails, occupies a major portion of this 85.6 acre site. The actual size of the contaminated areas, inclusive of 100-foot buffer zones, is 4.11 acres.

°Callahan Site

The Callahan site is comprised of 8.02 acres located approximately 1,000 feet west of the corporate limits of the City of Ellisville, Missouri. A pond, large barn and large wooded area are the major features of the property.

SITE HISTORY

On the morning of July 17, 1980, a contractor for the St. Louis Metropolitan Sewer District (MSD) encountered buried drums while excavating for a new sewer line in a semi-rural area about one-half mile west of Ellisville, Missouri. The drums were reported to the Missouri Department of Natural Resources (MDNR) and the U.S. Environmental Protection Agency (EPA) emergency response groups that same day. A preliminary investigation by MDNR and MSD of that site, which became known as the Rosalie Investment Company property, indicated a potentially serious threat to public health and the environment. Subsequently, two other areas were identified by informants or concerned citizens. The other areas are known as

the Callahan site and the Bliss site. Containerized and bulk liquid and solid wastes were disposed of on these three properties reportedly during the 1970s. The types of wastes included solvents, oils, sludges, pesticides and flammable gelatenous materials.

On October 23, 1981, EPA announced that the Ellisville Area Site was on the National Priorities List. MDNR had applied for federal assistance on September 25, 1981. A cooperative agreement was awarded to the State on March 17, 1982, under CERCLA. The objective of the cooperative agreement was to undertake a remedial investigation/feasibility study and to implement appropriate remedial actions. The site investigation proceeded in four phases. The purpose of Phase I, the full field investigation, was to characterize the wastes and define the extent of contamination still remaining at the site. The purpose of Phase II, the feasibility study, was to determine remedial actions for the site, conduct a cost/benefit analysis and recommend a preferred alternative. Phase I and II were completed by Black & Veatch. On September 28, 1983, the Feasibility Study was released. Phases III and IV will be engineering design and implementation of the preferred remedial alternatives identified in Phase II.

A. Rosalie Investment Company Property

Four dumping areas containing over 200 drums and one- and five-gallon buckets of chemical wastes have been discovered on the property, some of which were leaking wastes into Caulks Creek. Some of the drums were removed from one of the areas in August 1980, using federal funds available through Section 311 of the Clean Water Act. On August 6, 1980, the U.S. Coast Guard-Marine Safety Office contracted with Western Environmental Services for removal and disposal services of 45 (some reports say 47) drums suspected of containing hazardous materials. On August 8, 1980, removal was complete. The remaining drums containing trash from this area were removed and disposed at the expense of the Rosalie Investment Company. The remaining three areas were determined to be ineligible for Section 311 funds. In June 1981, the State of Missouri removed one hundred fifty-three (153) drums from two of the remaining three locations. They were transported to the Environmental Emergency Services (EES) facility in Chesterfield, Missouri, for temporary offsite storage. The drums were stored under a MDNR emergency storage permit until arrangements could be made for disposal at a Subtitle C facility. The MDNR applied for interim status for the facility. In May and June of 1982, the 153 drums were transported to two licensed disposal facilities. Drums containing solids were transported to Bob's Home Service (BHS) in Wright City, Missouri. Drums containing liquids were transported to ENSCO in El Dorado, Arkansas.

On July 7, 1982, Black & Veatch, Woodward-Clyde Consultants and MDNR personnel visited the Rosalie property to view the four dumping locations. No drums were seen, but drum lids and trash were observed. On August 30, 1982,

Black & Veatch stated in its "Draft Description of Current Situation" report that all of the containers found to date on the Rosalie site had been removed from the property and disposed of. However, they felt that potentially contaminated soil remained on the property at the four locations.

Between December 1982 and February 1983, a remedial field investigation was conducted at the Ellisville Area Site. This investigation was performed by Black & Veatch under contract to EPA. The objective of this investigation was to collect data to support the feasibility study for the Ellisville Area Site. During the course of the investigation, a reconnaissance was conducted at each of the three properties. Water, waste and air samples were obtained and submitted for chemical analysis.

An offsite investigation was also conducted to evaluate potential offsite migration of wastes from the three Ellisville sites and to obtain information to help assess potential impacts on human health resulting from waste migration from these sites. The offsite investigation was conducted in two phases. The first phase of the investigation was the sampling of four domestic drinking water wells. The second phase was the collection of surface water samples from five locations on Caulks Creek. (For a detailed assessment of data, refer to Attachment B-2: Remedial Investigation, Volume I: Summary Report, September 21, 1983, pp 39 and 40.)

B. Jean Ellen Callahan Property

In August 1980, MDNR received a report about past dumping activities on the property. An investigation of the Callahan property was conducted by MDNR on September 16 and 17, 1980. The purpose of the investigation was to determine if the property had been used for the disposal of hazardous waste as alleged by at least two informants. The investigation was conducted only on the surface area of the property. No excavation was done. The investigation revealed thirty-eight (38) 55-gallon drums either protruding from a filled ravine or below the filled area. Positive responses from a metal detector were recorded over the entire fill area. Probing the soil with a metal rod indicated buried metallic objects. Four additional drums were found exposed in the valleys south of the fill.

In late 1981 and early 1982, an Immediate Removal action at the Callahan property was initiated by MDNR and completed by EPA. On December 14, 1981, MDNR obtained access to the Callahan property and initiated excavation of buried drums, using state funds. The State of Missouri's contractor was Environmental Emergency Services. It became apparent to MDNR on December 17, 1981, that additional funds were needed for cleanup when the original estimates of 200 buried drums increased to around 1,000. MDNR requested assistance from EPA Region VII on that date. An EPA inspection team visited the site on December 18

and reported an imminent hazard to public health and the environment. EPA Region VII submitted an Immediate Removal funding request to EPA Headquarters on December 24, 1981. On December 30, 1981, EPA announced the availability of $210,000 of Superfund money. EES signed a contract with EPA and resumed removal and staging activities on January 4, 1982. A total of 907 drums were in secure storage either on the property or at BHS at the end of January 1982. The two onsite drum storage areas were secured from public access with chain link fencing. EPA approved an additional $100,000 on January 27, 1982, after the estimated number of drums increased to 1300.

The drum removal action was completed on February 18, 1982. One thousand two hundred and five (1205) drums were excavated. A total of 613 drums containing liquid and solid wastes were placed inside recovery drums and stored onsite. An additional eight (8) drums containing wastes from the Immediate Removal were also stored onsite. The remaining 592 drums were placed in bulk disposal containers and disposed of at BHS. A total of $310,000 was authorized by EPA for this removal action. Approximately $374,000 was expended by EPA and the State. Approximately 500 cubic yards of potentially contaminated soil was placed back in the excavated area and covered with plastic sheets.

On June 30, 1982, it was reported that a large portion of the backfilled soil had slid from beneath the plastic cover. Black & Veatch, Woodward-Clyde Consultants and MDNR personnel visited the Callahan property on July 7, 1982 to view the drums, the drum storage areas, the excavated and backfilled area and the backfill slide. The excavated and backfilled area was enclosed by a barbed-wire fence on July 21-22, 1982.

From July 21-27, 1983, Environmental Emergency Services removed and disposed of the 624 drums of hazardous waste stored onsite at the Callahan Site. The total contractual cost of the removal was $87,360.

CURRENT SITE STATUS

A reconnaissance was made of the Jean Ellen Callahan property during the Remedial Investigation on December 28 and 29, 1982, to obtain information useful in preparing an estimate of the volume and physical and chemical nature of the fill area which previously contained drum wastes. It was noted that the plastic tarp which had been placed over the fill area was severely torn or disintegrated. Soil sampling was conducted in four general areas on the Callahan Site. These four areas were: 1) in and around the existing fill area, 2) the two fenced drum storage areas, 3) surface water drainageways located downgradient of the fill area, and 4) a potential borrow area for the construction of a surface cap, located at the north side of the site. (For a detailed assessment of this data, refer to Attachment B-3: Remedial Investigation, Volume I: Summary Report, September 21, 1983, pp 28-30.)

The Remedial Investigation concluded that the soil in the fill area where drums were excavated during the 1981-82 removal action was physically unstable and susceptible to erosion. It was also determined that soil at the drum storage areas on the Callahan property was not contaminated. The remedial objective for the Callahan property is to stabilize the soil mass at its present location and to remove the vestiges of the Immediate Removal action at the site. These include removal and salvage of the chain-link and barbed wire fence and the gravel used in the two drum storage areas and removal of the plastic cover and its hold-down blocks.

A reconnaissance survey was conducted during the Remedial Investigation on the Rosalie Investment Company property on January 6, 1983. The purposes of this reconnaissance were: 1) to define a route of access to the four waste disposal locations on the Rosalie Site, 2) to identify each of the four waste disposal locations on the Rosalie Site, 3) to mark the approximate limits of these four locations, and 4) to note any remnants of past removal activities. Soil sampling was performed on the site at the four waste disposal locations, in a dry pond located downstream of the location designated as ELL-02, and in a portion of the former nursery operated on the Rosalie property. A surface water sample was obtained from a standing pool of water located in a ditch downstream from ELL-01. (For a detailed assessment of this data, refer to Attachment B-1: Remedial Investigation, Volume I Summary Report, pp 33-37.) In addition, a special analysis for 2,3,7,8-TCDD was performed by Envirodyne Engineers on a composite of the soil samples collected from the Rosalie Investment Company property. No 2,3,7, 8-TCDD was detected at a 1 ppb detection level. The following hazardous waste related problems were identified on the Rosalie Investment Company property: Location ELL-01 -- Contaminated soil susceptible to erosion; Location ELL-02-- Drums and contaminated soil; ELL-03 -- 1-gallon cans and drum debris; and Location ELL-04 -- 5-gallon cans.

Contaminated soils were detected at Location ELL-01 over an area of 360 square feet extending to a depth of two feet. Contaminated soils were detected at Location ELL-02 over an area of 1450 square feet and to a depth of four feet. Contaminants detected at these two locations are summarized in Tables R-4 and R-6 of the Remedial Investigation (attachment B-4). In addition, buried drums possibly containing hazardous substances were identified at Location ELL-02. Locations ELL-01 and ELL-02 are located directly in surface water drainage ditches which are tributaries of Caulks Creek. Undercutting of contaminated soil layers has been visually observed at Location ELL-01. Priority pollutants in excess of EPA water quality criteria for protection of human health and for toxicity to freshwater aquatic life have been detected in surface water samples from both the Callahan and Rosalie properties.

A release of hazardous substances to the environment has been observed at the Rosalie property. Contaminants detected include substances of high and moderate toxicity. Highly toxic substances detected on the Rosalie property

include phenol and 4-methylphenol (4-cresol). Moderately toxic substances detected in the Rosalie property include o-xylene, toluene, ethylbenzene and napthalene. These toxic substances are highly mobile in soil and could potentially migrate into ground water.

The Ellisville Area site is underlain by a limestone bedrock unit known as the Burlington-Keokuk (B-K) Formation having a thickness of approximately 170 feet in the region. This bedrock exhibits high water permeability along solution-enlarged joints. The pattern of these joints is generally random and highly unpredictable. In consequence, surface water flows into the bedrock (ground water recharge) and reappears on the surface (ground water discharge) at other locations. At the Rosalie property, this bedrock is overlain by approximately 25-30 feet of moderately permeable soil. The bedrock at the Callahan property is overlain by approximately 5-10 feet of moderately permeable soil. Depth to ground water is estimated to range from 70 to 140 feet at the Callahan site and from near surface to 150 feet at the Rosalie site. The bedrock aquifers receive substantial recharge from infiltration and percolation of precipitation. The lower Fern Glen Formation underlying the B-K formations may act as a aquitard because of its relative impermeability.

Both the Callahan and Rosalie properties are located in the 18.72 square mile Caulks Creek watershed. Caulks Creek has been classified as a losing stream by the Missouri Department of Natural Resources/Division of Geology and Land Survey. Some of its tributaries also appear to be losing streams. Due to the losing nature of the streams, water can disappear from the stream bed and either reappear at the surface or interflow with ground water. Through this mechanism, contaminants which are introduced into Caulks Creek are likely to enter the highly permeable alluvium in the bed of Caulks Creek and, hence, enter the ground water.

Ground water is an important resource of the region. It was estimated in 1982 that there were 70 wells in the Caulks Creek watershed, some of which are used for potable water supply. Many domestic wells reportedly exist in the vicinity of the Ellisville Area site. Some of these wells utilize the B-K or Fern Glen Formations as their source of potable water. By the processes described above, contaminants which enter Caulks Creek and its tributaries could potentially result in the contamination of private domestic wells in the area. As a secondary pathway, contaminants in contact with the B-K formations or their residuum and exposed to water through fluctuation of the water table, local saturation during periods of heavy runoff, or infiltration, are likely to enter the ground water.

ENFORCEMENT

Initially, Regional enforcement efforts were directed toward securing responsible party cleanup of each of the three properties comprising the Ellisville area site simultaneously. Following identification of the site, a responsible party search was conducted. Information obtained as a result of the search was forwarded

to EPA Headquarters, and on December 21, 1981, notice letters were sent to potentially responsible parties (PRPs). The PRPs identified as of that date with respect to the Callahan site included the site owner, Jean Ellen Callahan; transporter and disposer of the wastes, Russell Martin Bliss, Jerry-Russell Bliss, Inc., and American Can Company. Rosalie site PRPs notified were: former site owner, Houlihan Nursery Company; present owner, Rosalie Investment Company; transporter and disposer, Grover Callahan; and, Russell Martin Bliss, Jerry-Russell Bliss, Inc., and American Can Company.

In the interim between the transmittal of PRP information to EPA Headquarters and issuance of the notice letters on December 17, 1981, MDNR requested EPA assistance to complete cleanup of the Callahan site. At the request of the On-Scene Coordinator for the site, on December 28 and 29, 1981, the Office of Regional Counsel contacted each of the Callahan site PRPs to advise them of the necessity for immediate action to complete site cleanup and of the Agency's intent to undertake such action absent their willingness to do so. All parties contacted declined to undertake the response. Additionally, the site owner refused to grant permission for access to the site. Consequently, on December 31, 1981, a warrant for access was obtained from the United States District Court. Extensions of the warrant were obtained on January 14, 1982, and February 5, 1982, as the number of drums encountered during the removal action continued to exceed the OSC's estimates. Upon completion of the response, the site owner was given a receipt for all samples collected. On February 26, 1982, at the request of the site owner, portions of all samples collected at the site were provided.

PRP Negotiations

Both during and after completion of the Immediate Removal, several meetings were held with PRP generators of the wastes at the site to discuss possibilities for settlement of their liability. (As a result of information obtained during the Immediate Removal action, Kisco Company, Inc., The Orchard Corporation of America and GK Technologies, Inc., were identified as additional PRPs.) These negotiations failed to result in an acceptable offer of settlement.

Negotiations for responsible party cleanup of the Rosalie site have been conducted by the State and are ongoing. During a meeting with State officials on June 28, 1985, Rosalie Investment Company offered payment of a fixed sum toward future remedial action at the site. These negotiations will continue for a period not to exceed thirty (30) days following approval of the Record of Decision by the Regional Administrator.

Civil Actions

On August 30, 1981, a civil action for cost recovery was filed on behalf of EPA in the United States District Court for the Eastern District of Missouri [No. 84-2086(1)]. The action seeks reimbursement of $458,551.00 for actual costs and expenses incurred by the government for response actions at the Callahan site and a declaratory judgment for future costs and expenses. The case has been consolidated with three cases filed by the State of Missouri for recovery of State funds expended at each of the three Ellisville Area Site properties.

ALTERNATIVES EVALUATION

After completion of the Remedial Investigation, work on a Feasibility Study began. The final version was dated September 28, 1983. The objectives of the

Feasibility Study included the identification of remedial action objectives, the identification of remedial action alternatives and the selection of the most cost-effective remedial action alternatives for implementation at the Ellisville Site.

A. Rosalie Site

The remedial action objectives for the Rosalie property are to remove drums, cans and debris from ELL-02, ELL-03 and ELL-04 and either (1) reduce the concentrations of priority pollutants in soil at ELL-01 and ELL-02 or (2) remove the contaminated soil from ELL-01 and ELL-02.

Table 3 of the Feasibility Study (Attachment C-1) lists remedial technologies for the contaminated soil, buried drums, cans and debris on the Rosalie property. Table 3 also indicates whether the technology is appropriate for the Rosalie property and the reason if it is not appropriate. All of the listed remedial technologies are consistent with technologies presented in the National Contingency Plan (40 CFR 300.70) pertinent to the remedial action objectives.

An initial screening of the remedial technologies identified as appropriate in Table 3 for the Rosalie Investment Company property was performed in consideration of order of magnitude costs, effects of the alternative and acceptable engineering practices. The number of alternatives was narrowed to four following the initial screening.

Alternative		Estimated Capital Cost
R-1:	No Action	None
R-2:	Onsite biological treatment of contaminated soil and off-site disposal of debris and buried drums.	$97,000
R-3:	Onsite disposal	$200,000
R-4:	Offsite disposal	$52,000

A detailed analysis of these four remedial alternatives was performed following the initial screening. The following criteria were used to evaluate each of the remedial alternatives during the detailed analysis:

-Probable cost

-Significant adverse environmental effects

-Adequate control or effectiveness

-Reliability

-Implementability

-Operation and maintenance requirements

-Safety and regulatory requirements

-Public acceptance

In order to develop the alternatives and the evaluation criteria information, it was assumed that the lateral extent of soil contamination was 360 sq. ft. at ELL-01 and 1,450 sq. ft. at ELL-02. The number of buried drums was assumed to be 15.

The four remedial alternatives were evaluated in detail for the Rosalie Site. These alternatives are summarized in Table 2 of the Feasibility Study (Attachment G-1). Capping was not considered beyond the initial screening because this alternative would be ineffective at remedying the threat posed by the buried drums at ELL-02 and contaminated soil in the stream bank at ELL-01. Measures to stabilize and contain the stream bank at ELL-01 in combination with capping would prove far more costly than the alternatives evaluated in detail and would not remove the contamination and threat of release. Alternative R-1 (no action) would not remedy existing conditions which have the potential for causing adverse environmental and public health effects. The results of the Remedial Investigation indicated that the organic priority pollutant concentration in the soil had not significantly decreased since July 1981. Also, the buried drums would be left in place. The possibility of surface, ground and drinking water contamination would still exist from the contents of the drums. Alternative R-2 (onsite biological treatment of contaminated soil using landfarming techniques and offsite disposal of buried drums, drum lids, cans, and other debris), has the second highest probable cost. There currently exists no type of biological treatment which has been proven effective for the specific contaminants and conditions present on the Rosalie Investment Company property. Development of biological treatment technology would be costly and could prove ineffective. Alternative R-3 (onsite disposal of contaminated soil, buried drums, cans, metal fragments and trash in a secure landfill on the Rosalie property) has the highest probable cost. It would involve location of a landfill in a questionable geologic setting. It also would require long-term monitoring and maintenance. Alternative R-4 (offsite disposal of contaminated soil, buried drums, cans, metal fragments and debris) has the lowest probable cost and would provide the greatest benefit to public health and the environment. It would be the most acceptable to the public and would have no long-term maintenance or monitoring requirements. It is, therefore, recommended that Alternative R-4 be implemented as the remedial action for the drums, cans and contaminated soil on the Rosalie Investment Company property.

B. Callahan Site

Remedial technologies for the unstable fill area on the Callahan property are listed in Table 1 of the Feasibility Study (Attachment C-2) All, except for in-situ mass soil stabilization, are technologies presented in the National Contingency Plan (40 CFR 300.70) pertinent to the remedial action objectives. Table 1 indicates whether the technology is appropriate for the Callahan property and the reason if it is not appropriate.

A no-action alternative for the Callahan property was not evaluated in the Feasibility Study. This alternative will be discussed in this section of the Record of Decision. During the Remedial Investigation, core samples were collected from the Callahan fill area and surface soil and water samples were collected downgrade of the fill area. Results of analyses of these samples were presented in Tables C-3 and C-4 of the Remedial Investigation and are presented in Attachment H. Priority pollutant contaminants detected on the Callahan site during the Remedial Investigation include bis(2-ethylhexyl) phthalate, PCB-1254 and fluorotrichloromethane. Numerous other organic priority pollutant compounds were tentatively identified on the site. In addition, a composite sample of the fill area and a fill runoff sample were collected during the 1981-82 removal action. Contaminants detected in these samples include 2,4-dimethylphenol, phenol, napthalene, nitrobenzene, bis(2-ethylhexyl) phthalate, di-n-octyl phthalate, ethylbenzene, toluene and tetrachloroethylene. These results are presented in Attachment I. Contaminants detected on the Callahan property constitute a release to the environment. The Feasibility Study concludes that if stabilization of the fill area is not provided, erosion of the fill material will continue to occur. This erosion will enter the drainage way at the base of the fill and will result in continued offsite migration of hazardous substances. Due to this consideration, the no-action alternative was not selected for the Callahan fill area.

Both remedial alternatives evaluated for the Callahan property include removal of vestiges of the 1981-82 removal action. This action is required due to a commitment made to the site owner to restore the property following removal activities.

An initial screening of technologies identified in Table 1 as appropriate for the Jean Ellen Callahan property was performed in consideration of order of magnitude costs, effects of the alternative and acceptable engineering practices. A detailed analysis was then performed on the following two remedial alternatives using evaluation criteria presented above for the Rosalie Property alternative:

Alternative	Estimated Capital Cost
C-1: Immediate Removal Action Closure	$6,000
C-2: Fill Stabilization, Erosion Control and Immediate Removal Action Closure	$12,000

Both of the alternatives include onsite activities to remove the vestiges of the immediate removal action. These onsite activities include the following:

-Removal and disposal of the plastic cover remnants over the fill area.

-Removal and salvage of the barbed-wire fence around the fill area.

-Removal and salvage of the chain-link fence around the two drum storage areas.

-Removal and possible salvage of the gravel in the two drum storage areas.

The additional feature of Alternative C-2 is:

-Stabilization and erosion control measures for the soil mass in the fill area.

A comparison of the two alternatives appears in Table 4 of the Feasibility Study (Attachment G-2). In evaluating the two alternatives, alternative C-1 would not eliminate slippage and erosion of the soil mass in the excavated and backfilled area. Alternative C-2 addresses this problem along with the need for general closure activities which are common to both alternatives. The soil mass would be spread over a larger area at its present location and graded to a stable slope. A layer of top soil would be spread to a six inch depth over the area and compacted. The area would then be seeded to control further erosion. Selection of this remedial alternative will have no required operation and maintenance. Alternative C-2 is more costly than Alternative C-1, but its implementation would eliminate the potential for continued offsite migration of hazardous substances. It is, therefore, recommended that Alternative C-2 be implemented as the Remedial Action for the Callahan property.

COMMUNITY RELATIONS

The RI/FS for the Rosalie and Callahan portions of the Ellisville Area site was released for public comment in July 1984. Announcements were published in St. Louis area newspapers. On August 9, 1984, a public hearing was conducted at the St. Louis County Library, Daniel Boone Branch, 300 Clarkson Road, Ellisville, Missouri, to describe the remedial alternatives for the Rosalie and Callahan properties and the recommended remedial alternatives for site cleanup. Following the presentation of alternatives, attendees were allowed to comment orally upon the proposed remedial action. No opposition was voiced against the proposed actions or their associated costs. Written comments were accepted until August 17, 1984. None were received. A responsiveness summary has been prepared by the State (Attachment E). Citizens generally expressed a desire to allow state and federal officials to take the necessary actions to clean up the site such that it would pose no adverse effects to them or their children. They expressed concern about obtaining the necessary formal approval from EPA Headquarters in Washington, D.C., to implement the proposed Remedial Actions. Many wanted to know when federal officials would endorse the action. Overall, citizens reacted positively.

We believe that implementation of alternative R-4 (offsite disposal) will satisfy the concerns of citizens at the Rosalie Site. It has the lowest probable cost and would provide the maximum benefit to the public. We believe that implementation of alternative C-2 will satisfy the concerns of citizens at the Callahan site. It will correct the physical instability of the

backfilled soil mass and remove the vestiges of the 1981-82 Immediate Removal action. We believe that citizen concerns will be satisfied if the two recommended methods for site cleanup are implemented.

CONSISTENCY WITH OTHER ENVIRONMENTAL LAWS

The recommended Remedial Action at the Rosalie and Callahan properties involves offsite disposal of hazardous substances which pose a threat of release into the environment. The offsite disposal will be performed in accordance with current CERCLA offsite policy which requires the use of a recently inspected commercial disposal facility operating with an appropriate RCRA permit or interim status which has no significant violations or other environmental conditions which affect the satisfactory operation of the facility.

Contaminant levels at the Rosalie and Callahan properties will not be restored to background levels. However, the Centers for Disease Control has advised that the contaminant levels which are anticipated to remain following the Remedial Action do not represent a threat to public health. The substantial threat of a release into the environment will be greatly reduced. Removal of all contaminated material to achieve background concentrations in the soil would result in a cost that is disproportionate to other alternatives and would not provide a balance between the need for protection of public health, welfare and the environment with the amount of money available in the Fund to respond to other sites.

RECOMMENDED ALTERNATIVE

Section 300.68(j) of the National Contingency Plan (NCP) [47 FR 31180, July 16, 1982] states that the appropriate extent of remedy shall be determined by the lead agency's selection of the remedial alternative which the agency determines is cost effective (i.e., the lowest cost alternative that is technologically feasible and reliable) and which effectively mitigates and minimizes damage to and provides adequate protection of public health, welfare or the environment. Based on our evaluation of the cost effectiveness of each of the proposed alternatives, the comments received from the public, information from the Remedial Investigation and Feasibility Study Reports and information from the State, we developed Alternative R-4 for the Rosalie site and Alternative C-2 for the Callahan Site.

The selected Remedial Action at the Rosalie Investment Company Property involves excavation and offsite disposal of contaminated soil and buried drums at Locations ELL-01 and ELL-02, and removal and offsite disposal of drum lids, cans and other debris at locations ELL-02, ELL-03 and ELL-04. All onsite activities will be carried out in accordance with a site-specific Site Safety Plan developed during Remedial Design. Approximately twenty-seven (27) cubic yards of contaminated soil will be excavated from Location ELL-01 extending over an area of 360 square feet and to a depth of two (2) feet. An estimated 15 drums and 215 cubic yards of contaminated soil extending over an area of 1450 square feet

and to a depth of four (4) feet will be excavated from Location ELL-02. Soil samples will be collected from the perimeter and bottom of the excavations in order to determine contaminant levels which remain at Locations ELL-01 and ELL-02. This sampling will be performed in accordance with a sampling plan developed during Remedial Design and approved by the Centers for Disease Control (CDC). These soil samples will be analyzed for priority pollutants and the analytical results provided to CDC for assessment. If CDC determines that contaminant levels remaining onsite do not represent a threat to public health, then the excavations will be backfilled and reseeded. If CDC recognizes a remaining threat to public health, the contract will be modified to allow for the additional required excavation. Soil sampling will again be performed in accordance with a plan approved by CDC, and analytical results will be provided to CDC for assessment. This process will be repeated until CDC determines that a threat to public health no longer exists. All excavated soil will be transported in bulk to a commercial hazardous waste land disposal facility operating under an appropriate RCRA permit or interim status and meeting current CERCLA offsite policy, or if cost-effective, to a commercial hazardous waste incineration facility operating under an appropriate RCRA permit or interim status.

Results of soil sampling conducted during the Remedial Investigation have been reviewed by the Centers for Disease Control (CDC). CDC has advised that on the basis of the information presented in the Remedial Investigation, there does not appear to be a threat to public health due to soil contaminants detected at ELL-02 or those detected below a depth of two feet at ELL-01. For this reason, it is not anticipated that additional excavation will be required beyond the 240 cubic yards specified, if subsequent sampling confirms the soil conditions which were determined during the Remedial Investigation. However, subsurface conditions were not completely defined in the Remedial Investigation, and some possibility does exist that additional excavation may be required.

Excavation of buried drums at Location ELL-02 will proceed concurrently with soil excavation. When possible, duplicate samples will be collected from each of the excavated drums. One sample from each drum will be analyzed for priority pollutants and RCRA hazardous waste characteristics. Following sampling, each drum will be overpacked in 85-gallon recovery drums and temporarily stored onsite in a secured drum holding area until receipt of analytical results. Drums containing liquids will be disposed of by incineration at a commercial hazardous waste incineration facility operating under an appropriate RCRA permit or interim status. Drums containing solids will be disposed of at a commercial land disposal facility operating under an appropriate RCRA permit or interim status and meeting current CERCLA offsite policy, or if cost-effective, at a commercial hazardous waste incineration facility operating under an appropriate RCRA permit or interim status. Drums observed to contain non-hazardous substances or wastes (i.e., trash, garbage, debris, empty cans and other non-hazardous materials) may be disposed of at a permitted sanitary landfill. Drum lids, empty cans and other debris collected from Locations ELL-02, ELL-03 and ELL-04 will be deposited in 55-gallon drums. These drums may also be disposed of at a permitted sanitary landfill. Copies of analytical data for sampled drums will be provided to the appropriate disposal facility.

The offsite disposal of hazardous wastes at the Rosalie property meets the requirements of CERCLA Section 101(24). The alternative has been demonstrated to be more cost-effective than the other alternatives, and is necessary to protect public health, welfare and the environment from a present risk. Operation and maintenance requirements for this alternative will be the responsibility of the offsite permitted disposal facility. A breakdown of the capital costs appear in Attachment D-1. Alternative R-4 achieves the most reliable and effective protection of public health and environment at the lowest relative cost.

Alternative C-2 (Jean Ellen Callahan Property) will implement a Remedial Action to control erosion and slippage of the fill area where drums were excavated during the 1981-82 Immediate Removal and remove the vestiges of that action. The remnants of the plastic cover over the fill area and the cover's hold-down blocks will be removed and disposed of. The soil in the fill area will be regraded to a stable slope over a larger area, and covered with a 6 inch soil layer which will be compacted and reseeded. The barbed-wire fence around the fill area and the chain-link fence around the two drum storage areas will be removed and salvaged. The gravel in the two drum storage areas will be removed for possible salvage. The preliminary opinion of probable cost for this remedial action is $12,000. Implementation of this alternative will result in no operation and maintenance requirements. A breakdown of the capital cost estimates appears in Attachment D-2.

After giving careful consideration to the cost effectiveness of each alternative and evaluating the public comments received, the Missouri Department of Natural Resources recommended the following two alternatives: Alternative R-4 involving off-site disposal of contaminated soil, buried drums, cans and debris at the Rosalie Investment Company Property and Alternative C-2 involving stabilization and erosion control measures for the soil mass in the Callahan fill area and removal of the vestiges of the Immediate Removal. A letter confirming the State's decision appears on Attachment F.

OPERATION AND MAINTENANCE (O&M)

Recommended alternatives at the Rosalie and Callahan sites will require no O&M activities.

SCHEDULE

	Date
Approve Remedial Action (Sign ROD)	June 21, 1985
Amend/Award Cooperative Agreement for Remedial Design/ Remedial Action	August 2, 1985
Procure Design Contractor Under Class Deviation	September 6, 1985
Complete Design	November 29, 1985
Procure Construction Contractor	March 14, 1986

Initiate Construction	March 28, 1986
Complete Construction	June 27, 1986

FUTURE ACTIONS

The recommended alternatives at the Rosalie and Callahan sites will constitute a final action. All vestiges of past remedial activities and all materials posing a threat to public health, welfare, or the environment will be removed from the properties. No future remedial activities are anticipated.

ATTACHMENTS

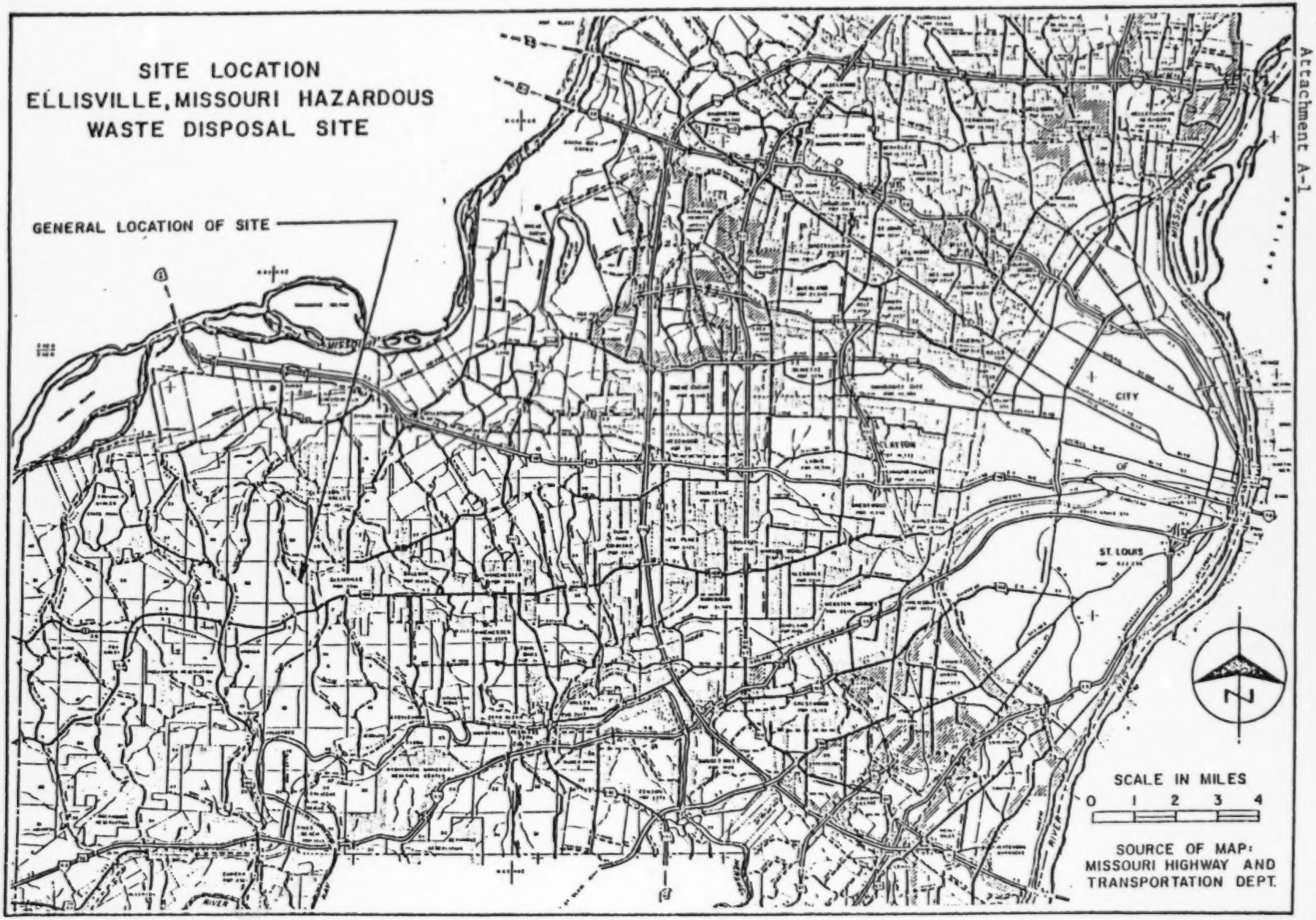

FIGURE 1

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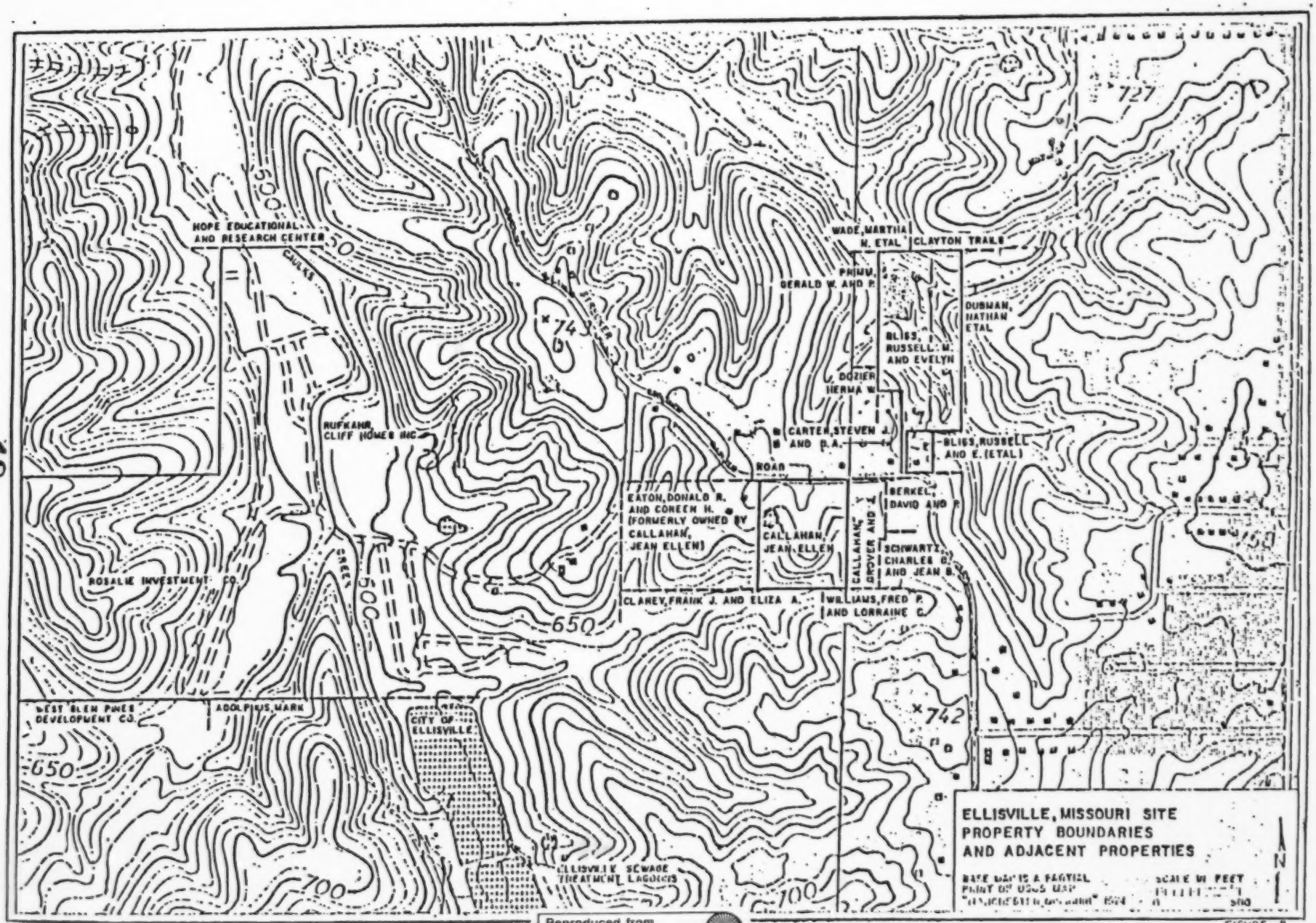

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FIGURE 2

5.2 DATA ASSESSMENT

Organic compound analyses were performed by MeadCompuChem on the 16 soil samples, the surface water sample, the background soil sample, and three field blank samples. The results of these analyses and field measurements are tabulated in Appendix R of Volume II. In addition, a special analysis for 2,3,7,8-TCDD was performed by Envirodyne Engineers on a composite of the soil samples collected from the Rosalie Investment Company property. No 2,3,7,8-TCDD was detected in that sample at a nominal detection level of 1 part per billion.

5.2.1 ELL-01

As presented in Table R-4, six priority pollutant organic compounds were detected in the subsurface soil samples from ELL-01: 2,4-dimethylphenol, phenol, naphthalene, ethylbenzene, methylene chloride, and toluene. Two non-priority pollutant compounds were detected and several other compounds were tentatively identified in the soil samples; these compounds included listed hazardous materials such as o-xylene, m-xylene, and oxirane. In general, the soil samples collected from the 0-1 foot and 1-2 foot depth ranges had higher measured concentrations of organic compounds than the deeper soil samples. Ethylbenzene and o-xylene were detected in both the subsurface soil samples collected at ELL-01 and the surface water sample collected downgrade of ELL-01 and ELL-11.

ELL-01 is located in a drainage ditch. The measured concentrations of phenol and naphthalene in upper 2 feet of the ditch bed were 40,000 and 50,000 ppb, respectively. Layers of organic waste materials were observed in the ditch banks where undercutting had occurred. The analytical data indicate some migration of organic compounds has occurred.

5.2.2 ELL-02

Exposed drums containing trash and exposed drums having unknown contents were observed at ELL-02. As indicated in Table R-6, thirteen priority pollutant organic compounds were detected in the soil samples collected at this location:

- 2,4-dimethylphenol
- phenol
- naphthalene
- bis(2-ethylhexyl)phthalate
- benzene
- chlorobenzene
- 1,1,2-trichloroethane
- ethylbenzene
- methylene chloride
- fluorotrichloromethane
- tetrachlorethylene
- toluene
- trichloroethylene

The actual presence of methylene chloride and fluorotrichloromethane in these samples is suspect, because the measured concentrations of these compounds were less than that of the field blank samples.

Eight non-priority pollutant organic compounds were detected and many other compounds were tentatively identified in the soil samples. These compounds included listed in hazardous materials such as:

acetone
methyl ethyl ketone (2-butanone)
4-methyl-2-pentanone
o-xylene
m-xylene
1,3-diisocyanatomethylbenzene
1-butanol
2-butanol
2-methyl-1-propanol

In general, more organic compounds were detected or tentatively identified at higher measured concentrations in the soils samples collected from the 2-3 foot and 3-4 foot depth ranges than in the two shallower soil samples and in the soil sample from the 1-2 foot depth range than in the shallowest soil sample. Only three compounds were detected or identified at low concentrations in the shallowest soil sample (0-1 foot depth range). The actual presence of two of these three compounds (methylene chloride and fluorotrichloromethane) is suspect, as stated earlier.

Methylene chloride was detected and cyclohexane and octacosane were tentatively identified in the sediment sample collected from the pond (ELL-05) downgrade of ELL-02. As stated earlier, the actual presence of methylene chloride in this sample is suspect. The other two organic compounds were not identified in the soil samples obtained from ELL-02.

ELL-02 is located in a drainage way. The analytical data does not indicate the past occurrence of or the potential for migration of organic compounds due to surface water transport. Different compounds were found in the downgrade pond sediment sample than at ELL-02. Soil in the layer most susceptible to erosion at ELL-02 was not contaminated. However, the concentrations of phenol and naphthalene measured in soil samples collected below 1-foot depth were 16,000 and 5,600 ppb, respectively.

5.2.3 ELL-03

Several 1-gallon cans and scattered drum debris were observed at ELL-03. As presented in Table R-8, nine priority pollutant organic compounds were detected in the soil samples collected at this location:

bis(2-ethylhexyl)phthalate
benzene
trans-1,2-dichloroethene
ethylbenzene
methylene chloride
fluorotrichloromethane
tetrachloroethylene
toluene
trichloroethylene

5.2.6 Summary

The following hazardous waste related problems were identified on the Rosalie Investment Company property:

Location	
ELL-01	Contaminated soil susceptible to erosion
ELL-02	Drums and contaminated soil
ELL-03	1-gallon cans and drum debris
ELL-04	5-gallon cans

6.2 DATA ASSESSMENT

Organic compound analyses were performed by California Analytical Laboratories, Inc. on the ground water samples from four drinking water wells, the five Caulks Creek water samples, and a field blank sample. In addition, the four drinking water samples and the blank sample were analyzed for priority pollutant and other metals by Rocky Mountain Analytical Laboratories, Inc. The results of these analyses and field measurements are tabulated in Appendix N of Volume II.

6.2.1 Groundwater Samples

As indicated in Tables N-2 and N-3, no organic compounds and only three metals (boron, iron, and zinc) were detected in the ground water samples from the four drinking water wells. Of the three metals detected, only zinc is a priority pollutant; iron and zinc are covered by the National Secondary Drinking Water Regulation. The concentrations of iron and zinc measured in the samples were less than the secondary maximum contaminant levels. In comparison to analytical results for samples collected by others in June 1981 and January 1982, these analytical results indicate that the ground water quality at the four wells is unchanged or improving.

6.2.2 Caulks Creek Samples

Six priority pollutant organic compounds--dibutyl phthalate, methylene chloride, tetrachloroethylene, aldrin, heptachlor, and lindane--were detected in the samples of water collected from Caulks Creek, as presented in Table N-5. Four of these--dibutyl phthalate, methylene chloride, tetrachloroethylene, and lindane--were detected in the water sample collected from Caulks Creek upstream of the Ellisville site (ELL-95); in the downstream samples, the concentrations of these compounds were essentially the same as in the upstream sample or these compounds were not detected. Aldrin and heptachlor were detected in the water sample collected from Caulks Creek downstream of the confluence with the Callahan property drainage way (ELL-96), but were not detected in the other upstream or downstream samples. This could indicate the Callahan property as the source for the aldrin and heptachlor; however, these compounds were detected in the samples collected from the Callahan property.

The concentrations of lindane measured in four of the Caulks Creek samples (the exception being the sample collected downstream of Lewis Spring) were in excess of the EPA 24-hour average criterion to protect freshwater aquatic life. The concentration of heptachor in the sample collected at ELL-96 exceeded the EPA 24-hour average criterion for freshwater aquatic life protection, while the concentration of dibutyl phthalate exceeded the EPA criterion for chronic toxicity to freshwater aquatic life. However, these concentrations were less than the EPA maximum or acute toxicity criteria.

Based on the collected evidence, the Ellisville site is not contaminating nearby drinking water wells and Caulks Creek.

4.2 DATA ASSESSMENT

Organic compound analyses were performed by MeadCompuChem on the seven soil/sediment samples, two water samples, and three field blank samples. The results of these analyses and field measurements are tabulated in Appendix C of Volume II. In addition, a special analysis for 2,3,7,8-TCDD was performed by Envirodyne Engineers on the composite soil sample collected from the fill area (ELL-21).

4.2.1 Fill Area

As indicated in Table C-3, the only priority pollutant detected in the composite soil sample collected from the fill (ELL-21) was bis(2-ethylhexyl) phthalate. The phthalate concentration in this sample was 13,000 ppb. The phthalate concentration represents a total of about 13 pounds of the compound in the 300 cubic yard fill. No 2,3,7,8-TCDD was detected in the sample at a nominal detection level of 1 part per billion. Cyclohexane, a listed hazardous material, and other tentatively identified organic compounds were also found in the soil sample from the fill. The evidence indicates the fill material is not contaminated.

Bis(2-ethylhexyl)phthalate was also found, along with PCB-1254, in the composite soil sample collected from a band 5 feet outside the fill (ELL-22). The concentrations of the phthalate and PCB in this sample were 1,400 and 189 ppb, respectively. No priority pollutant organic compounds were detected in the composite soil sample collected from a band 15 feet outside the fill (ELL-23). The results of the organic compound analyses on these samples indicate that very little lateral migration of organic compounds from the fill has occurred into the adjacent valley walls.

4.2.2 Downgrade of Fill Area

The organic compound analysis results for the two soil/sediment and two water samples collected downgrade of the fill are presented in Table C-4.

Bis(2-ethylhexyl)phthalate and fluorotrichloromethane were the only priority pollutants detected in the soil/sediment sample collected in the drainage way about 20 feet downgrade of the fill (ELL-24). The actual presence of fluorotrichloromethane is suspect because the measured concentration was less than that found in a field blank sample. Similar concentrations of bis(2-ethylhexyl)phthalate were found in the soil samples collected from the fill (ELL-21) and 20 feet downgrade of the fill. The tentatively identified compound 1,3,5-cycloheptatriene was found in the samples collected at both ELL-21 and ELL-24; however, the measured concentration of this compound in the sample collected 20 feet downgrade of the fill was about 1 percent of that in the sample from the fill. Cyclohexane was identified in the sample from the fill, while an oxidation product of that compound--cyclohexanol--was identified in sample collected 20 feet downgrade of the fill. A listed hazardous material--1,3-diisocyanatomethylbenzene--and other tentatively identified organic compounds were also found in the sample collected at ELL-24.

Similar to the sample from ELL-24, bis(2-ethylhexyl)phthalate and fluorotrichloromethane were the only priority pollutants detected in the soil/sediment sample collected in the drainage way about 180 feet downgrade of the fill (ELL-25). As before, the actual presence of fluorotrichloromethane is suspect. The measured concentration of the phthalate in the sample collected at ELL-25 was about 7 percent of that in the samples collected upgrade at ELL-21 and ELL-24.

No organic compounds were detected or identified in the surface or alluvial water samples collected from the creek at two locations downgrade of the fill's drainage way (ELL-26 and ELL-27).

These data indicate that some migration of organic compounds from the fill has occurred. This is probably due to surface water transport of soil particles eroded from the fill. The data indicate that the extent of migration has not reached the creek which drains the Callahan property.

4.2.3 Drum Storage Areas

The organic compound analysis results for the two soil samples obtained from the two drum storage areas are presented in Table C-5. Three priority pollutant organic compounds--isophorone, bis(2-ethylhexyl) phthalate, and methylene chloride--were detected in the two soil samples. Two listed hazardous materials--oxirane and m-xylene--and other tentatively identified compounds were also found in the soil sample obtained from the west drum storage area.

4.2.4 Summary

Based on the analytical results, there are no contaminated soils on the Jean Ellen Callahan property.

TABLE R-4 (Page 1 of 3)
ELLISVILLE SITE: ROSALIE PROPERTY
ORGANIC COMPOUND ANALYSIS RESULTS FOR ELL-01 AREA SAMPLES
Case: 1434 Laboratory: Mead CompuChem
(See Table R-12 for list of analyzed compounds and detection limits)

	Soil concentration in parts per billion (ppb) wet basis				Water Concentration in micrograms per litre (ug/L)
Depth (ft):	0-1	1-2	2-3	3-4	---
Sample No.:	ELL-01-SS-01	ELL-01-SS-02	ELL-01-SS-03	ELL-01-SS-04	ELL-11-SW-01
Traffic Report:	T1765	T1766	T1767	T1768	T1777
Date:	1/11/83	1/11/83	1/11/83	1/11/83	1/14/83
Detection Limit*:	(1)	(1)	(1)	(2)	(3)
Priority Pollutant Compounds					
Acid Compounds:					
2,4-dimethylphenol	nd**	4,800	nd**	nd	nd
phenol	16,000**	40,000	nd**	nd	nd
other acid compounds	nd**	nd	nd**	nd	nd
Base/Neutral Compounds:					
naphthalene	38,000	56,000	nd	nd	nd
other base/neutral compounds	nd	nd	nd	nd	nd
Volatiles:					
ethylbenzene	nd	1,600	nd	nd	6.2
methylene chloride	nd	270	32	11,000	nd
toluene	250	580	nd	nd	nd
other volatiles	nd	nd	nd	nd	nd
Pesticides:	nd	nd	nd	nd	nd
Dioxins:**	nd	nd	nd	nd	nd
Non-Priority Pollutant Compounds					
Acid Compounds:					
4-methylphenol	7,800**	18,000	nd**	nd	nd
other acid compounds	nd**	nd	nd**	nd	nd

TABLE R-4 (Page 2 of 3)
ELLISVILLE SITE: ROSALIE PROPERTY
ORGANIC COMPOUND ANALYSIS RESULTS FOR ELL-01 AREA SAMPLES
Case: 1434 Laboratory: Head CompuChem
(See Table R-12 for list of analyzed compounds and detection limits)

	Soil concentration in parts per billion (ppb) wet basis				Water Concentration in micrograms per litre (ug/L)
Depth (ft):	0-1	1-2	2-3	3-4	---
Sample No.:	ELL-01-SS-01	ELL-01-SS-02	ELL-01-SS-03	ELL-01-SS-04	ELL-11-SW-01
Traffic Report:	T1765	T1766	T1767	T1768	T1777
Date:	1/11/83	1/11/83	1/11/83	1/11/83	1/14/83
Detection Limit*:	(1)	(1)	(1)	(2)	(3)
Non-Priority Pollutant Compounds					
Base/Neutral Compounds:	nd	nd	nd	nd	nd
Volatiles:					
o-xylene	4,800	5,800	nd	nd	23
other volatiles	nd	nd	nd	nd	nd
Tentatively Identified Compounds					
1-ethyl-2-methylbenzene	210	52,000	nf	nf	nf
2-ethyl-1,4-dimethylbenzene	nf	25,000	nf	nf	nf
1,3-dimethylbenzene (m-xylene)	300	48,000	nf	nf	nf
1,2,3-trimethylbenzene	nf	71,000	nf	nf	nf
1,2,4-trimethylbenzene	460	nf	nf	nf	nf
1,3,5-trimethylbenzene	280	32,000	nf	nf	nf
benzofuran	nf	20,000	nf	nf	nf
7-methylbenzofuran	nf	52,000	nf	nf	nf
methyl cyclohexane	nf	nf	860	nf	nf
2-methoxyethanol	nf	nf	nf	8,600	nf

TABLE R-4 (Page 3 of 3)
ELLISVILLE SITE: ROSALIE PROPERTY
ORGANIC COMPOUND ANALYSIS RESULTS FOR ELL-01 AREA SAMPLES
Case: 1434 Laboratory: Head CompuChem
(See Table R-12 for list of analyzed compounds and detection limits)

	Soil concentration in parts per billion (ppb) wet basis				Water Concentration in micrograms per litre (ug/L)
Depth (ft):	0-1	1-2	2-3	3-4	---
Sample No.:	ELL-01-SS-01	ELL-01-SS-02	ELL-01-SS-03	ELL-01-SS-04	ELL-11-SW-01
Traffic Report:	T1765	T1766	T1767	T1768	T1777
Date:	1/11/83	1/11/83	1/11/83	1/11/83	1/14/83
Detection Limit*:	(1)	(1)	(1)	(2)	(3)
Tentatively Identified Compounds					
(2-methoxyethoxy) ethene	nf	nf	nf	68,000	nf
methylester formic acid	nf	nf	nf	5,000	nf
1,3,3-trimethyl-bicyclo[2.2.1]heptan-2-one	2,300	2,200	nf	nf	nf
1,7,7-trimethyl-bicyclo[2.2.1]heptan-2-one	3,300	nf	nf	nf	nf
2,3-dihydro-1H-indene	150	nf	nf	nf	nf
2,3-dihydro-4-methyl-1H-indene	83	nf	nf	nf	nf
1H-indene	nf	44,000	nf	nf	nf
benzonitrile	nf	1,800	nf	nf	nf
oxirane	nf	nf	nf	9,600	nf
4-(1,1,3,3-tetramethylbutyl)phenol	nf	nf	nf	nf	77
3-phenyl-2-propenal	220	nf	nf	nf	nf
dimethyl disulfide	nf	nf	nf	nf	3.7

NOTES: *Detection limit number cited refers to column number in Table R-12
**EPA Region 7 recommended that data be rejected due to low surrogate recoveries
nd Not detected
nf Not found

TABLE R-6 (Page 1 of 4)
ELLISVILLE SITE: ROSALIE PROPERTY
ORGANIC COMPOUND ANALYSIS RESULTS FOR ELL-02 AREA SAMPLES
Case: 1434 Laboratory: Head CompuChem
(See Table R-12 for list of analyzed compounds and detection limits)

	Concentration in parts per billion (ppb) wet basis				
Depth (ft):	0-1	1-2	2-3	3-4	--
Sample No.:	ELL-02-SS-01	ELL-02-SS-02	ELL-02-SS-03	ELL-02-SS-04	ELL-05-SL-[illegible]
Traffic Report:	T1760	T1761	T1762	T1763	T1770
Date:	1/11/83	1/11/83	1/11/83	1/11/83	1/11/83
Priority Pollutant Compounds / Detection Limit*:	(1)	(1)	(1)	(1)	(1)
Acid Compounds:					
2,4-dimethylphenol	nd	800	1,100	1,700**	nd
phenol	nd	4,900	11,000	16,000**	nd
other acid compounds	nd	nd	nd	nd**	nd
Base/Neutral Compounds:					
naphthalene	nd	3,000	5,600	560	nd
bis (2-ethylhexyl) phthalate	nd	nd	1,500	550	nd
other base/neutral compounds	nd	nd	nd	nd	nd
Volatiles:					
benzene	nd	nd	5.2	3.0	nd
chlorobenzene	nd	nd	4.1	nd	nd
1,1,2-trichloroethane	nd	nd	5.9	nd	nd
ethylbenzene	nd	2.5	930	580	nd
methylene chloride	18	23	40	910	3.3
fluorotrichloromethane	3.6	nd	nd	2.5	nd
tetrachloroethylene	nd	5.6	nd	nd	nd
toluene	nd	nd	720	910	nd
trichloroethylene	nd	nd	nd	12	nd
other volatiles	nd	nd	nd	nd	nd

TABLE R-6 (Page 2 of 4)
ELLISVILLE SITE: ROSALIE PROPERTY
ORGANIC COMPOUND ANALYSIS RESULTS FOR ELL-02 AREA SAMPLES
Case: 1434 Laboratory: Head CompuChem
(See Table R-12 for list of analyzed compounds and detection limits)

	Concentration in parts per billion (ppb) wet basis				
Depth (ft):	0-1	1-2	2-3	3-4	--
Sample No.:	ELL-02-SS-01	ELL-02-SS-02	ELL-02-SS-03	ELL-02-SS-04	ELL-05-SL-01
Traffic Report:	T1760	T1761	T1762	T1763	T1770
Date:	1/11/83	1/11/83	1/11/83	1/11/83	1/11/83
Detection Limit*:	(1)	(1)	(1)	(1)	(1)
Priority Pollutant Compounds (cont.)					
Pesticides:	nd	nd	nd	nd	nd
Dioxins**:	nd	nd	nd	nd	nd
Non-Priority Pollutant Compounds					
Acid Compounds:					
2-methylphenol	nd	720	920	11,000**	nd
4-methylphenol	nd	760	3,800	8,400**	nd
other acid compounds	nd	nd	nd	nd**	nd
Base/Neutral Compounds					
2-methylnaphthalene	nd	nd	1,100	nd	nd
other base/neutral compounds	nd	nd	nd	nd	nd
Volatiles.					
acetone	nd	nd	1,200	2,700	nd
2-butanone	nd	nd	920	3,500	nd
4-methyl-2-pentanone	nd	nd	190	8,200	nd
styrene	nd	nd	74	nd	nd
o-xylene	nd	8.8	5,800	1,600	nd
other volatiles	nd	nd	nd	nd	nd

TABLE R-6 (Page 3 of 4)
ELLISVILLE SITE: ROSALIE PROPERTY
ORGANIC COMPOUND ANALYSIS RESULTS FOR ELL-02 AREA SAMPLES
Case: 1434 Laboratory: Mead CompuChem
(See Table R-12 for list of analyzed compounds and detection limits)

	Concentration in parts per billion (ppb) wet basis				
Depth (ft):	0-1	1-2	2-3	3-4	--
Sample No.:	ELL-02-SS-01	ELL-02-SS-02	ELL-02-SS-03	ELL-02-SS-04	ELL-05-SL-01
Traffic Report:	T1760	T1761	T1762	T1763	T1770
Date:	1/11/83	1/11/83	1/11/83	1/11/83	1/11/83
Detection Limit*:	(1)	(1)	(1)	(1)	(1)
Tentatively Identified Compounds					
diethyl benzene	nf	nf	4,000	nf	nf
1,2-diethylbenzene	nf	3,000	nf	nf	nf
1,3-dimethylbenzene (m-xylene)	nf	8,400	2,200	590	nf
1-ethyl-2-methylbenzene	nf	nf	5,700	380	nf
1-ethyl-3-methylbenzene	nf	nf	20,000	nf	nf
2-ethyl-1,4-dimethylbenzene	nf	4,700	4,300	nf	nf
(1-methylethyl) benzene	nf	nf	1,100	360	nf
1-methyl-2-(2-propenyl) benzene	nf	410	nf	nf	nf
propylbenzene	nf	nf	4,800	300	nf
1,2,3-trimethylbenzene	nf	nf	12,000	nf	nf
1,2,4-trimethylbenzene	nf	6,000	nf	800	nf
1,3,5-trimethylbenzene	nf	15,000	10,000	800	nf
1,3-diisocyanatomethylbenzene	nf	430	nf	nf	nf
1-butanol	nf	nf	4.8	nf	nf
2-butanol	nf	nf	58	31	nf
3-methyl-2-butanone	nf	nf	0.4	nf	nf
cyclohexane	nf	nf	nf	nf	24,000
1-chlorodecane	90	nf	nf	nf	nf

TABLE R-6 (Page 4 of 4)
ELLISVILLE SITE: ROSALIE PROPERTY
ORGANIC COMPOUND ANALYSIS RESULTS FOR ELL-02 AREA SAMPLES
Case: 1434 Laboratory: Head CompuChem
(See Table R-12 for list of analyzed compounds and detection limits)

	Concentration in parts per billion (ppb) wet basis				
Depth (ft):	0-1	1-2	2-3	3-4	--
Sample No.:	ELL-02-SS-01	ELL-02-SS-02	ELL-02-SS-03	ELL-02-SS-04	ELL-05-SL-01
Traffic Report:	T1760	T1761	T1762	T1763	T1770
Date:	1/11/83	1/11/83	1/11/83	1/11/83	1/11/83
Detection Limit*:	(1)	(1)	(1)	(1)	(1)
Tentatively Identified Compounds (cont.)					
2-ethoxyethanol	nf	nf	5,800	nf	nf
2,2-dimethyl-3-methylene-bicyclo [2.2.1] heptane	nf	nf	4.4	nf	nf
1,7,7-trimethyl-bicyclo [2.2.1] heptan-2-one	nf	nf	23	nf	nf
5-methyl-2-hexanone	nf	nf	nf	42	nf
2,3-dihydro-1H-indene	nf	950	nf	nf	nf
octacosane	nf	nf	nf	nf	850
4-methyl-2-pentanol	nf	nf	nf	64	nf
4-methyl-4-penten-2-one	nf	nf	nf	2.6	nf
2,3-dimethylphenol	nf	nf	nf	440	nf
3-ethylphenol	nf	nf	5,200	2,700	nf
2-methylpropanal	nf	nf	nf	3.3	nf
2-methyl-1-propanol	nf	nf	nf	2.6	nf
2-propanol	nf	nf	57	15	nf
3-phenyl-2-propenal	nf	nf	1,500	nf	nf

Notes: *Detection limit number cited refers to column number in Table R-12.
**EPA Region 7 recommended that data be rejected due to low surrogate recoveries.
nf Not found
nd Not detected

TABLE 3

REMEDIAL TECHNOLOGIES FOR ROSALIE INVESTMENT COMPANY PROPERTY

Remedial Technologies	Remarks
A. Surface Water Controls	
1. Surface seals	Appropriate for onsite disposal
2. Surface water diversion and collection systems	Appropriate for onsite disposal
3. Grading	Appropriate for all onsite actions
4. Revegetation	Appropriate for all onsite actions
B. Subsurface Controls	
1. Impermeable barriers, such as slurry walls	Not appropriate for near surface contamination
2. Permeable treatment beds	Not appropriate: water table below contamination
3. Groundwater pumping	Not appropriate: water table below contamination
4. Leachate control, such as liners	Appropriate for onsite disposal
C. Insitu Treatment	
1. Solution mining	Not appropriate: clay soil, hydrogeological setting
2. Detoxification	Not appropriate: clay soil
3. Microbiological degradation	Not appropriate: contamination too deep
D. Onsite Treatment	
1. Incineration/wet air oxidation	Not appropriate: mobile equipment not available
2. Solidification/ encapsulation	Appropriate for onsite containment and capping
3. Soil washing	Not appropriate: clay soil
4. Detoxification	Not appropriate: clay soil
5. Microbiological degradation	Appropriate for onsite treatment
E. Soil Removal	
1. Excavation	Appropriate for onsite treatment, onsite disposal, and offsite disposal
2. Hydraulic dredging	Not appropriate: above water table
3. Mechanical dredging	Not appropriate: above water table
F. Offsite Transport for Secure Disposal	Appropriate for offsite disposal

TABLE 1

REMEDIAL TECHNOLOGIES FOR JEAN ELLEN CALLAHAN PROPERTY

	Remedial Technologies	Remarks
A.	Surface Water controls	
1.	Surface seals	Appropriate for erosion control
2.	Surface water diversion and collection systems	Appropriate for erosion control
3.	Grading	Appropriate for erosion control and slope stabilization
4.	Revegetation	Appropriate for erosion control and slope stabilization
B.	Subsurface Controls	
1.	Impermeable barriers, such as slurry walls	Not appropriate: no contaminated soil
2.	Permeable treatment beds	Not appropriate: no contaminated soil
3.	Groundwater pumping	Not appropriate: no contaminated soil
4.	Leachate control, such as liners	Not appropriate: no contaminated soil
C.	Insitu Treatment	
1.	Solution mining	Not appropriate: no contaminated soil
2.	Detoxification	Not appropriate: no contaminated soil
3.	Microbiological degradation	Not appropriate: no contaminated soil
D.	Onsite Treatment	
1.	Incineration/wet air oxidation	Not appropriate: no contaminated soil
2.	Solidification/	Not appropriate: no contaminated soil
3.	Soil washing	Not appropriate: no contaminated soil
4.	Detoxification	Not appropriate: no contaminated soil
5.	Microbiological degradation	Not appropriate: no contaminated soil
E.	Soil Removal	
1.	Excavation	Appropriate for slope stabilization

TABLE 1
(continued)

Remedial Technologies	Remarks
2. Hydraulic dredging	Not appropriate: above water table
3. Mechanical dredging	Not appropriate: above water table
F. Insitu Soil Mass Stabilization	
1. Surface compaction	Not appropriate: soil mass to deep
2. Vibratory compaction	Not appropriate: clay soil
G. Offsite Transport for Secure Disposal	Not appropriate: no contaminated soil

Attachment D-1

Rosalie Investment Company Property
Cost Estimate-Alternative R-4

Capital Cost of the Recommended Alternative

Alternative R-4: Offsite disposal

Mobilization, decontamination, and demobilization:		$ 10,000
Drum lids, cans, buckets, metal fragements, and miscellaneous debris removal:		
6 man-days @ $10 per hour x 2.5		1,200
Buried drum excavation:		
15 drums @ $140 per drum		2,100
Drum sampling and screening analyses:		
15 drums @ $40 per drum		600
Disposal drum purchase:		
10 55-gallon drums @ $20 per drum		200
15 85-gallon drums @ $85 per drum		1,300
Overpacking of excavated drums:		
15 drums @ $20 per drum		300
Loading of drums on truck:		
25 drums @ $20 per drum		500
Transport of drums to BHS:		
1 load @ $165 per load		200
Contaminated soil excavation:		
240 cy @ $8 per cy		1,900
Transport of contaminated soil to BHS:		
240 cy; 15 cy loads; 90% full		
18 loads @ $165 per load		3,000
Disposal at BHS:		
10 55-gallon drums @ $30 per drum		300
15 85-gallon drums @ $47 per drum		700
18 x 15 cy @ $49 per cy		13,200
Borrow soil excavation, transport, placement, and compaction (on-site borrow):		
240 cy @ $5 per cy		1,200
Reseeding of excavated areas:		
200 sy @ $0.40 per sy		100
Profit on transport and disposal subcontracts (10%):		1,700
	Subtotal	$ 38,500
Contingencies (10%):		3,900
	Subtotal	$ 42,400
Engineering design services:		10,000
	Total	$ 52,400
Preliminary opinion of probable cost:		$ 52,000

Capital Cost of the Recommended Alternative

Alternative C-2: Erosion Control

Mobilization and demobilization:		$2,000
Plastic cover debris and hold-down block removal:		
4 man-days @ $10 per hour X 2.5		800
Disposal drum purchase:		
10 55-gallon drums @ $20 per drum		200
Transport of drums to BHS:		
1 load @ $165 per load		200
Disposal of drums at BHS:		
10 drums @ $30.20 per drum		300
Borrow soil excavation, transport, placement, and compaction (on-site borrow):		
170 cy @ $5 per cy		900
Rough grading, spreading, and seeding:		
1,000 sy @ $1.40 per sy		1,400
Chain-link fence removal and salvage:		
745 feet @ $1.75 per foot		1,300
Gravel stockpiling:		
290 cy @ $0.75 per cubic yard		200
Barbed-wire fence removal and salvage:		
800 feet @ $1.50 per foot		1,200
	Subtotal	$8,500
Contingencies (10%):		900
	Subtotal	$9,400
Engineering design services:		2,500
	Total	$11,900
Preliminary opinion of probable cost:		$12,000

Attachment E

DRAFT

RESPONSIVENESS SUMMARY

On August 9, 1984, the Missouri Department of Natural Resources (MDNR) and the United States Environmental Protection Agency (U.S. EPA) conducted a public meeting at the Daniel Boone Branch of the St. Louis County Library, 300 Clarkson Road, Ellisville, Missouri. The purpose of the meeting was to invite the public to comment on proposals for completing cleanups at two areas of the Ellisville Area Site in St. Louis County. One of the sites is located on property owned by Jean Ellen Callahan. More than twelve hundred (1200) drums were excavated from a ravine on this property in 1982. The other site is located on property owned by the Rosalie Investment Company. About two hundred (200) drums were removed from this property in 1981. The two sites are near Caulks Creek, north of Manchester Road and west of Strecker Road. The third area of the Ellisville Area Site is located on property owned by Russell and Evelyn Bliss and adjacent owners. It is the only site of the three where dioxin has been found. The U.S. EPA is currently working on an expanded Feasibility Study for this site, since both MDNR and U.S. EPA decided that additional cleanup options should be evaluated for the dioxin contaminated soil.

At the Jean Ellen Callahan property, the recommended remedial alternative presented by state and federal officials called for erosion control of the fill area and removal of the onsite vestiges of the 1981-82 immediate removal action. The remnants of the plastic cover over the fill area would be removed and disposed of. The barbed-wire fence around the fill area and the chain-link fence around the two drum storage areas would be removed and salvaged. The gravel in the two drum storage areas would be scraped up and stockpiled on the property. The soil in the fill area would be spread and regraded to a stable slope, covered with a compacted soil layer, and reseeded. The probable cost for this remedial action was estimated to be $12,000.

At the Rosalie Investment Company property, the recommended remedial alternative presented by state and federal officials called for offsite disposal of contaminated soil, buried drums, cans, and debris. Contaminated soil would be excavated and transported in bulk to an offsite permitted hazardous waste landfill. Drum lids, cans, debris, etc. would be placed in drums. Any buried drums encountered during excavation would be placed in overpack drums, and the contents would be sampled and analyzed.The drums would be transported to permitted disposal facilities according to the characteristics of their contents. Borrow soil would be placed and compacted in the excavated areas with all disturbed areas reseeded. The probable cost of this remedial action was estimated to be $52,000.

DRAFT

Following the presentation of the two recommended remedial alternatives, the public was allowed to comment orally on the proposals. The consensus of public opinion was that state and federal officials should be allowed to complete the cleanups at the two sites. They wanted the government to do whatever was necessary to cleanup the sites, so that they would be safe for themselves and particularly their children. They expressed concern that the necessary federal approval might not be obtained. They were aware that the money needed for cleanups could be allocated to a higher priority site, if EPA headquarters decided the proposed actions were not necessary or cost-effective.

Another concern of the public was the benefit that responsible parties would derive from the proposed remedial actions. Their property would be restored to unrestricted use without expenditure of funds on their part. Many citizens felt that the responsible parties should be compelled to contribute toward the costs of cleaning up the two sites. Citizens wanted to know how much had been spent by state and federal officials. It was explained to citizens that both agencies were attempting to recover cleanup expenditures from the responsible parties.

In summary, officials determined that local citizens were not opposed to the two recommended remedial alternatives or their associated costs. Following public input, the recommendations were not modified. Based on the positive response received, we believe that the two alternatives for site cleanups, if chosen to be implemented, will be acceptable to the community.

After July 9, 1984, the Feasibility Study was available for public review at the Daniel Boone Branch for the St. Louis County Library. The public was allowed to provide written comments until August 17, 1984. The MDNR did not receive any written comments.

JS:ss

MISSOURI DEPARTMENT OF NATURAL RESOURCES
P.O. Box 176 Jefferson City, Missouri 65102 (314) 751-4422

March 28, 1984 39 Attachment F

State Recommendation

Mr. Morris Kay
Regional Administrator
U.S. EPA Region VII
324 East Eleventh Street
Kansas City, MO 64106

Dear Mr. Kay:

This letter is to provide Missouri's official position concerning implementation of remedial actions to clean up contamination at the Ellisville site. We have reviewed the EPA contractor's feasibility study which considers various alternatives and recommends specific remedial actions. The State of Missouri is in agreement with all recommended alternatives except for the recommendations for handling dioxin contaminated soils.

Since the Feasibility Study was drafted, the Missouri Dioxin Task Force has presented their findings and recommendations and the Governor has adopted those Task Force recommendations as official state policy. The Task Force recommendations recommend secure temporary storage of dioxin contaminated soils as most appropriate until a final treatment or disposal technology is developed.

In view of these developments, we strongly recommend the implementation of secure temporary on-site storage of the dioxin contaminated soils. We feel the cost of such an alternative would be similar to the costs currently estimated for the recommended alternatives. Secure temporary storage may in fact be the lowest cost alternative, and it is an alternative which is technologically feasible and which effectively minimizes damage to and provides adequate protection of public health, welfare, and the environment. We feel a remedial action to provide secure temporary on-site storage of these materials would be consistent with the State's policies for dealing with dioxin sites.

Sincerely,

DEPARTMENT OF NATURAL RESOURCES
ORIGINAL SIGNED BY
RON KUCERA

Fred A. Lafser
Director

FAL:sjd

cc: Waste Management Program

Christopher S. Bond Governor
Fred A. Lafser Director

TABLE 2
COMPARISON OF CALLAHAN PROPERTY ALTERNATIVES

Alternative	Preliminary Opinion of Probable Cost	Significant Adverse Environmental Effects	Adequate Control or Effectiveness	Reliability	Implementability	Operation and Maintenance Requirements	Safety and Regulatory Requirements	Public Acceptance
C-1: Immediate Removal Action Closure	$ 6,000	Would leave soil in unstable condition, increasing possibility of further erosion & sloughing	Would not control physically unstable soil mass	Would have no control of erosion or sloughing	Good	None	Disregards	Leaving soil in physically unstable condition not acceptable
C-2: Erosion Control	$12,000	None	Yes	Good	Good	None	None	Good

Attachment G-2

TABLE 4
COMPARISON OF ROSALIE PROPERTY ALTERNATIVES

Alternative	Preliminary Opinion of Probable Cost	Significant Adverse Environmental Effects	Adequate Control or Effectiveness	Reliability	Implementability	Operation and Maintenance Requirements	Safety and Regulatory Requirements	Public Acceptance
R-1: No action	$ 0	Yes-Degradation of surface, ground and drinking water quality possible	Questionable, natural mechanisms have not been shown to definitely attenuate contamination	Questionable due to suspect assumption of natural degradation	Good	None	Disregards	Probably negative since soil contamination and some drums would still remain.
R-2: Onsite biological treatment and offsite disposal of containers and contents	$ 97,000	Yes-Potential for greatest air quality degradation	Yes, if proven effective by treatability study	Reliable if proven effective by treatability study	Good	Would require monitoring and testing after initial treatment	Would require a fence to restrict access to areas being treated	Probably positive if air quality is not noticeably affected
R-3: Onsite disposal in a secure landfill	$200,000	Yes-Questionable geological setting	Yes	Reliable as long as integrity of the landfill liner and cap is maintained	Questionable geological setting due to high bedrock formation	Would require long term monitoring and maintenance and restrictive land use	Would require monitoring well installation	Probably negative to continued presence of hazardous wastes in a residential area, even if wastes are contained in a secure landfill
R-4: Offsite disposal at permitted disposal facility	$ 52,000	None apparent	Yes	Good	Good	Responsibility of the offsite permitted disposal facility	Responsibility of the offsite permitted disposal facility.	Probably positive to removal of hazardous waste from a residential area

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TABLE C-3 (Page 1 of 2)
ELLISVILLE SITE: CALLAHAN PROPERTY
ORGANIC COMPOUND ANALYSIS RESULTS FOR FILL-AREA SUBSURFACE SOIL SAMPLES
Case: 1433 Laboratory: Mead CompuChem
(See Table C-7 for list of analyzed compounds and detection limits)

	Concentration in parts per billion (ppb) wet basis		
Location:	Inside Fill	5' from fill	15' from fill
Sample No.:	ELL-21-SS-01	ELL-22-SS-01	ELL-23-SS-01
Traffic Report:	T1730	T1848	T1849
Date:	12/29/82	2/15/83	2/16/83
Detection Limit*:	(1)	(2)	(3)
Priority Pollutant Compounds			
Acid Compounds:	nd	nd	nd
Base/Neutral Compounds:			
bis (2-ethylhexyl)phthalate	13,000	1,400	nd
other base/neutral compounds	nd	nd	nd
Volatiles:	nd	nd	nd
Pesticides:			
PCB-1254	nd	189	nd
other pesticides	nd	nd	nd
Dioxins**:	nd	nd	nd
Non-Priority Pollutant Compounds			
Acid Compounds:	nd	nd	nd
Base/Neutral Compounds:	nd	nd	nd
Volatiles:	nd	nd	nd

TABLE C-3 (Page 2 of 2)
ELLISVILLE SITE: CALLAHAN PROPERTY
ORGANIC COMPOUND ANALYSIS RESULTS FOR FILL-AREA SUBSURFACE SOIL SAMPLES
Case: 1433 Laboratory: Mead CompuChem
(See Table C-7 for list of analyzed compounds and detection limits)

	Concentration in parts per billion (ppb) wet basis		
Location:	Inside Fill	5' from fill	15' from fill
Sample No.:	ELL-21-SS-01	ELL-22-SS-01	ELL-23-SS-01
Traffic Report:	T1730	T1848	T1849
Date:	12/29/82	2/15/83	2/16/83
Detection Limit*:	(1)	(2)	(3)
Tentatively Identified Compounds			
2,6-bis(1,1-dimethylethyl)-4-methylphenol	5,500	nf	nf
1,3,5-cycloheptatriene	20,000	380	nf
cyclohexane	660,000	nf	nf
11-decyldocosane	27,000	nf	nf
1,3-dimethylbenzene (m-xylene)	nf	300	nf
eicosane	50,000	nf	nf
hexatriacontane	43,000	nf	nf
pentacosane	90,000	nf	nf
2-propenylidenecyclobutene	nf	nf	280

NOTES: *Detection limit number cited refers to column number in Table C-7
**EPA Region 7 recommended that data be rejected due to low surrogate recoveries
nd Not detected
nf Not found

TABLE C-4 (Page 1 of 2)
ELLISVILLE SITE: CALLAHAN PROPERTY
ORGANIC COMPOUND ANALYSIS RESULTS FOR SAMPLES DOWN-GRADE OF FILL
Case: 1433 Laboratory: Head Compu Chem
(See Table C-7 for list of analyzed compounds and detection limits)

	Soil Concentration in parts per billion (ppb) wet basis		Water Concentration in micrograms per litre (ug/L)	
Location:	North End of Drainageway	South End of Drainageway	Creek at Drainageway	Creek at West Property Boundary
Sample No.:	ELL-24-SL-01	ELL-25-SL-01	ELL-26-SW-01	ELL-27-SW-01
Traffic Report:	T1728	T1729	T1741	T1742
Date:	12/30/82	12/30/82	1/5/83	1/5/83
Detection Limit*:	(4)	(3)	(5)	(5)
Priority Pollutant Compounds				
Acid Compounds:	nd	nd	nd**	nd**
Base/Neutral Compounds:				
bis (2-ethylhexyl) phthalate	16,000	1,000	nd	nd
other base/neutral compounds	nd	nd	nd	nd
Volatiles:				
fluorotrichloromethane	3.8	3.9	nd	nd
other volatiles	nd	nd	nd	nd
Pesticides:	nd	nd	na	nd
Dioxins**:	nd	nd	na	nd
Non-Priority Pollutant Compounds				
Acid Compounds:	nd	nd	nd**	nd**

TABLE C-4 (Page 2 of 2)
ELLISVILLE SITE: CALLAHAN PROPERTY
ORGANIC COMPOUND ANALYSIS RESULTS FOR SAMPLES DOWN-GRADE OF FILL
Case: 1433 Laboratory: Mead Compu Chem
(See Table C-7 for list of analyzed compounds and detection limits)

	Soil Concentration in parts per billion (ppb) wet basis		Water Concentration in micrograms per litre (ug/L)	
Location:	North End of Drainageway	South End of Drainageway	Creek at Drainageway	Creek at West Property Boundary
Sample No.:	ELL-24-SL-01	ELL-25-SL-01	ELL-26-SW-01	ELL-27-SW-01
Traffic Report:	T1728	T1729	T1741	T1742
Date:	12/30/82	12/30/82	1/5/83	1/5/83
Detection Limit*:	(4)	(3)	(5)	(5)
Non-Priority Pollutant Compounds (Cont'd)				
Base/Neutral Compounds:	nd	nd	nd	nd
Volatiles:	nd	nd	nd	nd
Tentatively Identified Compounds				
1,3,5-cycloheptatriene	170	nf	nf	nf
cyclohexanol	170	nf	nf	nf
N-cyclohexylcyclohexanamine	990	nf	nf	nf
1,3-diisocyanatomethylbenzene	200	nf	nf	nf
1,3-isobenzofurandione	510	nf	nf	nf
hexadecanoic acid	nf	1,100	nf	nf

NOTES: *Detection limit number cited refers to column number in Table C-7.
**EPA Region 7 recommended that data be rejected due to low surrogate recoveries.
na Not analyzed
nd Not detected
nf Not found

TABLE 6

JEAN ELLEN CALLAHAN PROPERTY SAMPLE ANALYSIS RESULTS SUMMARY
DETECTED ORGANIC PRIORITY POLLUTANTS

Identified Compounds	Composite Drum Sample 9/16/80 (ppm)	Composite Fill Soil Sample 2/9/82 (ppm)	Fill Runoff Sample 9/16/80 (ppb)	Surface Water Maximums Unknown Locations Onsite 12/23/81 (ppb)	Fill Leachate Sample 1/5/82 (ppb)	EPA Water Quality Criteria Human Health (ppb)
2,4-dimethylphenol	NR	9.4	NR	27	563	400
phenol	NR	15.5	20,000	676	4,020	3,500
1,2,4-trichlorobenzene	NR	NR	NR	3	NR	--
isophorone	NR	NR	150	337	700	5,200
napthalene	2	0.9	NR	ND	NR	
nitrobenzene	NR	NR	760	ND	NR	19,800
bis (2-ethylhexyl) phthalate	5,370	20.3	NR	120	590	15,000
di-n-butyl phthalate	17	NR	NR	1	NR	34,000
di-n-octyl phthalate	NR	16.1	NR	20	NR	--
diethyl phthalate	29	NR	NR	3	NR	350,000
dimethyl phthalate	389	NR	NR	ND	NR	
benzene	NR	NR	NR	48*	NR	6.6
1,1,1-trichloroethane	NR	NR	NR	48*	NR	18,400
1,2-trans-dichloroethylene	NR	NR	NR	5	NR	--
ethylbenzene	NR	2.3	NR	15	60	1,400
methylene chloride	NR	1.7	NR	1,810	540	1.9
toluene	R	62.9	NR	5,910	6,950	14,300
tetrachloroethylene	NR	1.9	NR	ND	NR	
vinyl chloride	R	NR	NR	ND	NR	
BHC-alpha	NR	NR	NR	0.013	NR	0.092
BHC-gamma	NR	NR	NR	0.005	NR	0.186

ALL OTHER ORGANIC PRIORITY POLLUTANTS NOT REPORTED OR NOT DETECTED
R - Reported present in drum sample (1/20/82)
NR - Not reported in available data.
ND - Not detected
* - Same as reported for laboratory blank

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ATTACHMENT I